CHAPTER 1

INTRODUCING OSHA'S SAFETY AND HEALTH PROGRAM MANAGEMENT GUIDELINES

How can you increase worker protection, cut business costs, enhance productivity, and improve employee morale?

There are many ways you, as a business owner or manager, can approach this challenge. One way is by doing a better job of managing your company's safety and health program.

No matter how sophisticated your safety and health efforts, they can always be improved. No matter how small your worksite, systematic methods for protecting workers can work for you.

Effective management is the key to reducing the numbers and severity of workplace injuries and illnesses. This means using proven methods to find and understand existing and potential hazards, and then either preventing or controlling those hazards. A direct relationship exists between effective management and low numbers and severity of injuries. We also credit good management with lower levels of work-related illness: a well-managed safety and health program prevents or controls employee exposure to toxic substances or other unhealthful conditions that can cause sickness.

The Safety and Health Program Management Guidelines, published in the Federal Register (54 CFR 3908) on January 26, 1989, were developed from the safety and health program elements used by the Wisconsin Safety Consultation Program and other national state-run onsite consultation services which are geared toward small and medium-sized businesses, and from the Voluntary Protection Program (VPP) requirements which are geared toward large businesses.

Recommendations in the Guidelines work! Although the recommendations are not mandatory, we urge employers in all industries to adopt these management practices. With the help of the Guidelines, we are confident that any company can establish a successful safety and health program.

This chapter briefly reviews each section of the Guidelines and the benefits you can expect from carrying out its recommendations. We will be referring to subsequent chapters for more detailed explanations of how to carry out the recommendations. Many of the following chapters include tools useful in initiating or improving management systems for worker protection. The information which is presented is intended for the full spectrum of large and small industry worksites and is not dependent on any particular management style.

THE GUIDELINES

The Guidelines outline a management program whose purpose is to accomplish the following: to recognize and understand all the hazards and potential hazards of the workplace; to prevent or control those hazards; and to train employees at all levels so they understand the potential hazards they may be exposed to and know how to help protect themselves and others. To accomplish this, the Guidelines are divided into four parts called major elements:

- Management Leadership and Employee Involvement
- Worksite Analysis
- Hazard Prevention and Control
- Safety and Health Training

Each element is further divided in several recommended actions.

MANAGEMENT LEADERSHIP AND EMPLOYEE INVOLVEMENT

This element describes the leadership that management provides to encourage employee involvement at all levels in safety and health protection. Many actions listed under this element are applicable to all areas of business management. The Guidelines simply put them to use in improving worker safety and health protection. The actions cover:

- Safety and Health Policy,
- Goal and Objectives,
- Visible Top Management Leadership,
- Employee Involvement,
- Assignment of Responsibility,
- Provision of Adequate Authority and Resources,
- Accountability, and
- Program Evaluation.

These actions can be visualized as a management "circle":

SAFETY AND HEALTH POLICY. By developing a clear statement of management policy, you help everyone involved with the worksite understand the importance of safety and health protection in relation to other organizational values. By clearly communicating the policy to all employees, you ensure that no confusion will exist when a conflict arises between two of these values, such as productivity and safety or health. Here is the language of the Guidelines that describes this desired action:

> *State clearly a worksite policy on safety and healthful work and working conditions, so that all personnel with responsibility at the site and personnel at other locations with*

responsibility for the site understand the priority of safety and health protection in relation to other organizational values.

For information on and samples of worksite safety and health policies, see Chapter 2.

GOALS AND OBJECTIVES. You make your general safety and health policy specific by establishing a clear goal and objectives for your program. These set the framework for assigning responsibility. Each employee should be able to see his/her work activities in terms of moving toward the goal and achieving objectives. The language of the Guideline is:

Establish and communicate a goal for the safety and health program and objectives for meeting that goal, so that all members of the organization understand the results wanted and the measures planned for achieving them.

For examples and information on goals and objectives, see Chapter 2.

VISIBLE TOP MANAGEMENT LEADERSHIP. If employees can see the emphasis that top management puts on safety and health, they are more likely to emphasize it in their own activities. It is important for worksite managers to follow set safety and health rules and work practices in order to provide an example for rank and file workers. Managers should show their involvement in other ways, as well: for example, making plant-wide safety and health inspections; chairing the safety and health committee; personally stopping activities or conditions that are hazardous until the hazards can be corrected or controlled; personally tracing safety and health performance; and — an essential management function — holding managers and employees **accountable** for their actions. The element of management leadership also should include ensuring equal safety and health protection of any contract workers at the site. Remember that actions speak louder than words. The language of the Guideline is:

Provide visible top management leadership in setting up the program and ensure that all workers at the site, including contract workers, are provided equally high quality safety and health protection, so that all will understand that management's commitment is serious.

For further information, see Chapter 3.

EMPLOYEE INVOLVEMENT. The best worker safety and health protection occurs when everyone at the worksite shares responsibility for protection. For that to happen, all employees must know that they are helping to develop the program. Employees at all levels should be actively involved in finding and correcting safety and health problems. This does not mean the employer gives up responsibility and authority. The Occupational Safety and Health Act of 1970 places responsibility for worker protection against occupational hazards squarely on the employer. The wise employer, however, uses employees' unique knowledge and experience to help find problems and resolve them successfully. The Guidelines recommend that employers:

Provide for and encourage employee involvement in the structure and operation of the program and in decisions that effect their safety and health, so that they will commit their insight and energy to achieving the safety and health program's goal and objectives.

For more information on employee involvement and how to initiate or improve it, see Chapter 4.

ASSIGNMENT OF RESPONSIBILITY. Everyone in the workplace should have some responsibility for safety and health. Clear assignment helps avoid overlaps or gaps in accomplishing needed activities. In particular, you should make sure that the safety/health 'expert' at the worksite is not assigned line responsibility that properly belongs to line managers and supervisor. The line responsibility would include managers and supervisors. This line responsibility would include functions such as supervising and evaluating a worker's performance in areas of safety and health, providing on-the-job training in safe work practices and personal protective equipment (PPE), and encouraging worker participation in safety and health activities. The responsibilities should flow logically from the objectives that were set to meet the general program goal. The actual language of the Guidelines is:

> *Assign and communicate responsibility for all aspects of the program, so that managers, supervisors, and employees in all parts of the organization know what performance is expected of them.*

For more information and examples of assigned responsibility, see Chapter 5.

PROVISION OF AUTHORITY/RESOURCES. Any realistic assignment of responsibility must be accompanied by needed authority and adequate resources. The latter includes appropriately trained and equipped personnel as well as sufficient operational and capital funding. The language of the Guideline is:

> *Provide adequate authority and resources to responsible parties, so that assigned responsibility can be met.*

ACCOUNTABILITY. Once you have assigned responsibility and provided the appropriate authority and resources to individuals, you must follow up by holding these persons accountable for achieving what they have been asked to do. Accountability is crucial to helping employees understand how critical their individual performance s are and to teaching them to take personal responsibility for their performance. The Guidelines recommend that employers:

> *Hold managers, supervisors, and employees accountable for meeting their responsibilities, so that essential tasks will be performed.*

For more information on developing accountability, see Chapter 6.

PROGRAM EVALUATION. Once your safety and health program is up and running, you will want to ensure its quality. You do this by evaluating program activities and their results in relation to the established goal and objectives. During this evaluation, keep these questions in mind: "Did we get where we wanted to go?" "Did each specific activity help us get there?" The guidelines suggest that employers:

> *Review program operations at least annually to evaluate their success in meeting the goal and objectives, so that deficiencies can e identified and the program and/or the objectives can be revised when they do not meet the goal of effective safety and health protection.*

For more information on safety and health program evaluation and useful evaluation tools, see Chapter 12.

WORKSITE ANALYSIS

Worksite analysis is a combination of systematic actions that provide you with the information needed to recognize and understand the existing and potential hazards of your workplace. While these actions may appear complicated at first glance, they consist of activities that already are being performed in most workplaces. For the sake of clarity, the Guidelines differentiate these actions as follows:

- Comprehensive Hazard Identification
  - Comprehensive Hazard Surveys
  - Change Analysis
  - Routine Hazard Analysis
- Regular Site Safety and Health Inspections
- Employee Reports of Hazards
- Accident/Incident Investigations
- Injury and Illness Trend Analysis

COMPREHENSIVE HAZARD IDENTIFICATION. There are three components of a complete hazard inventory from which a program of prevention and control can be designed.

The first of these is the comprehensive survey. This is the most basic of all the tools used to establish the inventory of hazards and potential hazards at your worksite. This survey is best performed by experts from outside the worksite who have a broad-based knowledge that includes safety engineering, industrial hygiene, and often, occupational medicine. After the initial survey, comprehensive surveys need to be repeated only periodically. These will enable the expert who is conducting the survey to apply new information concerning the hazards or methods of control.

The second component of comprehensive hazard identification is change analysis. This means what its name suggests. Each time there is a change of facilities, equipment, processes or materials in your workplace, the intended change should be analyzed for hazards before being introduced. This helps avoid exposing your workers to new hazards. Also, it helps you to avoid the needless expense of retrofitting controls after installation and use.

The final component of a complete hazard inventory is routine hazard analysis. The basic form of this analysis which is useful at every type of worksite is the job safety analysis. This analysis divides a job into tasks and steps and then analyzes the potential hazards of each step. The analysis produces a method of prevention or control to reduce exposure. A variation that is used at worksites with highly complex hazards — such as chemicals or nuclear energy — is the process hazard analysis. This analysis reduces a process to its smallest elements, identifies the hazards of these elements, and devises the preventive measures or controls. In rapidly changing workplaces such as construction, phase hazard analysis is another useful form of the routine hazard analysis. Here each phase of the rapidly changing work is analyzed for the new hazards it may introduce so that preventions or controls can be devised.

The language of the Guidelines follows:

> *So that all hazards are identified: (a) conduct comprehensive worksite surveys to establish safely and health hazard inventories and update the surveys periodically as expert understanding of hazards and the methods of control in our industry change; (b) analyze planned and new facilities, processes, materials, and equipment; and (c) perform routine hazard analysis of jobs, processes, and/or varied phases of work as needed.*

For more information and tools to help you, see Chapter 8.

REGULAR SITE SAFETY AND HEALTH INSPECTIONS. General site inspections should be performed by personnel at the worksite. These employees will need training to recognize hazards that can slip through the controls designed to reduce employee exposure. Inspectors also should watch for hazards that may not have been identified in the comprehensive survey or uncovered by other means. The actual language of the Guidelines is:

> *Provide for regular site safety and health inspections, so that new, recurring, or previously missed hazards and failures in hazard controls are identified.*

For further information, see Chapter 9.

EMPLOYEE REPORTS OF HAZARDS. A successful safety and health program finds and corrects problems before any harm is done. Involving a greater number of workers in the monitoring process will increase the thoroughness and efficiency of the process. It is imperative that one or more systems be established for employees to alert management to the hazards. It also follows that employees who report hazards will be protected from harassment. Employees should see timely and appropriate responses to their reports. These responses are visible evidence of management's desire for meaningful employee involvement. The actual language of the Guidelines is:

> *So that employee insight and experience in safety and health protection may be used and employee concerns addressed, provide a reliable system for employees, without fear of reprisal, to notify management personnel about conditions that appear hazardous and to receive timely and appropriate responses, and encourage the employees to use the system.*

For further information and assistance, see Chapter 9.

ACCIDENT/INCIDENT INVESTIGATION. Investigating accidents and incidents (these terms are defined in Chapter 9) presents another opportunity to find hazards and design prevention and controls. For each accident, there usually are several steps that must be taken to prevent future occurrences. The Guidelines recommend that you:

> *Provide for investigation of accidents and "near miss" incidents, so that their causes and the means for their prevention are identified.*

For further information, see Chapter 9 and the National Safety Council publication, "Accident Investigation...A New Approach."

INJURY AND ILLNESS TREND ANALYSIS. It is useful to review injuries and illnesses that have occurred over a period of time, including those illnesses that do not appear to be occupationally related. Such an analysis may reveal patterns or clusters that suggest common worksite causes or origins not apparent when the cases first were recorded. The Guidelines recommend that employers:

> *Analyze injury and illness trends over time, so that patterns with common causes can be identified and prevented.*

For further information, see Chapter 9.

HAZARD PREVENTION AND CONTROL

Once you have inventoried the hazards and potential hazards of your workplace, you can begin designing a program of prevention and control. Your program will consist of:

- Appropriate Control
- Preventive Maintenance
- Emergency Preparation
- Medical Program

APPROPRIATE CONTROLS. In designing a program of prevention and control, the ideal choice always is prevention of employee exposure to a hazard. This means removing the hazard or preventing exposure through engineering controls. Where neither of these measures is feasible, the next best choice is complete inclosure. Where complete enclosure is not feasible, a combination of partial enclosure and work practices, perhaps including PPE, is the next best choice. Where no enclosure is possible, a combination of work practices and PPE should be used.

Keep in mind that work practices and PPE place special responsibilities on the employees who use them. Employees should be trained to understand why these protective measures are necessary and how they can use these methods to protect themselves and others. Protective measures should be stressed every possible way, concluding when necessary, the use of fair and consistent discipline.

When all other controls fail to provide enough reduction in exposure, appropriate administrative controls such as worker rotation, should be used. The actual language of the Guidelines is:

> *So that all current and potential hazards, however detected, are eliminated or controlled in a timely manner, establish procedures for that purpose, using the following measures:*
>
> *(a) engineering techniques where feasible and appropriate;*
>
> *(b) procedures for safe work that are understood and followed by all affected parties, because of training, positive reinforcement, correction of unsafe performance, and, if necessary, enforcement through a clearly communicated disciplinary system;*
>
> *(c) provision of personal protective equipment; and*
>
> *(d) administrative controls, such as reducing the duration of exposure.*

For further information, see Chapter 8.

PREVENTIVE MAINTENANCE. A good equipment maintenance program can keep engineering control systems working as intended and can prevent ordinary non-hazardous equipment from becoming hazardous. For these reasons, the Guidelines recommend that you:

> *Provide for facility and equipment maintenance, so that hazardous breakdown is prevented.*

For further information, see Chapter 8.

EMERGENCY PREPARATION. Planning and preparing for emergencies is an essential part of any effective safety and health program. The greater the possibility of an emergency, the more preparation should be done. All employees should know exactly what they must do in each type

of emergency. With sufficient practice the responses needed at times of crisis can become practically automatic. The language of the Guidelines is:

> *Plan and prepare for emergencies, and conduct training and drills as needed, so that the response of all parties to emergencies will be "second nature."*

For further information, see Chapter 8.

MEDICAL PROGRAM. Having a medical program onsite does not necessarily mean having an onsite doctor or nurse. It does mean involving occupational health professionals in worksite analysis for hazards, in hazard prevention and control programs, in early recognition and treatment of injuries and illnesses, and in limiting the severity of illness and injury. For smaller businesses, these important tasks can be arranged by contract with occupational health professionals. Besides health professionals, other employees at the site should be trained in first aid and CPR. The Guidelines recommend that you:

> *Establish a medical program that uses occupational health professionals in the analysis of hazards, early recognition and treatment of illnesses and injury, and limitation of the severity of harm; and which provides first aid and cardiopulmonary resuscitation (CPR) onsite and physician and emergency medical care nearby, so that harm will be minimized if an injury or illness does occur.*

For more information, see chapter 10.

SAFETY AND HEALTH TRAINING

For an effective program of safety and health management, it is crucial that everyone at the worksite understand his/her role in that program, the hazards and potential hazards that need to be prevented or controlled, and the ways to protect themselves and others. You can achieve such a program by:

- Ensuring that employees understand hazards,
- Ensuring that supervisors understand their responsibility to:
  - analyze the work under their supervision of hazards,
  - maintain physical protections, and
  - reinforce and enforce needed protective measures; and
- Ensuring that managers understand their responsibilities.

EMPLOYEES. At a minimum, employees must know the general safety and health rules of the worksite, specific site hazards and the safe work practices needed to help control exposure, and the individual's role in all types of emergencies. You usually can achieve this by thorough orientation, periodic safety and health training, and emergency drills. Additional specialized training may be needed to teach skills required for the job or for activities under the safety and health program. The actual language of the Guideline is:

> *Ensure that all employees understand the hazards to which they may be exposed and how to prevent harm to themselves and others from exposure to these hazards, so that employees accept and follow established safety and health protections.*

For information about employee activities within a safety and health program, see Chapter 4.

SUPERVISORS Supervisors should be given special training to help them in their leadership role. They should be taught to look for hidden hazards in the workplace under their supervision, to insist upon the maintenance of the physical protection in their areas, and to reinforce employee hazard training through performance feedback and, when necessary, fair, consistent enforcement. The Guidelines recommend:

> *So that supervisors will carry out their safety and health responsibilities effectively, ensure that they understand those responsibilities and the reasons for them, including:*
>
> *(a) analyzing work under their supervision to identify unrecognized potential hazards;*
>
> *(b) maintaining physical protections in their work areas; and*
>
> *(c) reinforcing employee training on the nature of potential hazards in their work and on needed measures, through continual performance feedback and, if necessary, through enforcement of safe work practices.*

For further information, see Chapter 11.

MANAGERS. All line managers must understand their own responsibilities for safety and health. This probably will not require special classroom training; however, you will need some form of effective communication that will raise managers' safety and health awareness. The Guidelines recommend that employers:

> *Ensure that managers understand their safety and health responsibilities as described under "Management Leadership and Employee Involvement," so that managers will effectively carry out those responsibilities.*

For further information, see Chapter 11.

SUMMARY

Based on a variety of experiences, we are convinced that good management of worker safety and health protection will translate into fewer injuries and illnesses. We also believe that effective management will pay off in better employee morale, higher productivity, and improved product quality. This manual can help set up a quality safety and health management program to provide that protection. The information we present is useful whether you own or manage a small or large business. We predict that your efforts to protect your workers will be amply rewarded.

APPENDIX 1-1 WHAT DIFFERENCE DOES IT MAKE?

There are several good reasons for improving the way you manage your worker protection program. Better management can help reduce lost time and costs; improve productivity, morale, and quality of product; prevent OSHA citations; and, should the need ever arise, strengthen your company's position during any judicial proceedings.

REDUCED INJURIES

One consultation project conducted a study to assess the outcomes of employer participation in the Safety and Health Achievement Recognition Program (SHARP) program in their state. They found that those employers who participated in SHARP for two or more years on average experienced only 40 percent of the injuries expected for their respective industries and less than half (46%) of the total number of injuries expected for these industrial classifications overall.

A small meatpacking establishment with 95 employees, after working with the consultation project to develop an effective workplace safety and health program, lowered their loss workday injury rate (LWDI) from 18.9 to 7.0.

REDUCED COSTS

One fabricated structural steel manufacturing operation began working with the consultation project two years ago. Since that time, their LWDI rate has dropped from 14.0 to 1.0, and they have returned a portion of workers' compensation premiums back to the employees. To date, more than $50,000 has been distributed back to their employees.

By implementing an effective management program a millwork company reduced their workers compensation cost from over $350,000 to $40,000 in a four year period. As a result, the company was able to purchase another woodworking company to supplement their operations.

A Business Roundtable Report, "Improving Construction Safety Performance" (New York: The Business Roundtable, Report A-3, January 1982, p.16) concludes that for construction, the savings from effective administration of safety and health protection is 3.2 times the cost.

Frank E. Bird, Jr., in Management Guide to Loss Control, (Loganville, GA: Institute Press, 1978), says that for every $1 spent on medical or insurance compensation costs - considered "direct costs" - for a worker injury, from $5 to $50 more is likely to be spent on "indirect costs" to repair building, tool, or equipment damage; to replace damaged products or materials; and to make up for production delays and interruptions. He says that an additional $1 to $3 in indirect costs will be spent for hiring and training replacements and for time needed to investigate the incident. Mr. Bird's figures do not consider the impact of reduced commitment to work when employees operate in a situation in which injuries are common. And, because they frequently involve longer absences, the impact of job-related illnesses can be even greater than work-related injuries.

According to James Findlay and Raymond Kuhlman in Leadership in Safety, (Loganville, GA: Institute Press, 1980), effective safety and health management can contribute more to organizational profits than your best salesmen. They recommend that you use a chart similar to the one below to figure out the estimated impact of accidents to your organization. The chart shows the amount of extra sales needed to pay for accidents; i.e., if your profit margin is 4 percent, it is necessary for you to sell an additional $250,000 in products to pay the cost of $10,000 in annual losses from injury, illness or property damage. With a 2 percent profit, sales must be increased to $500,000 in order to cover the $10,000 in losses.

ACCIDENT COSTS	1% PROFITS	2% PROFITS	3% PROFITS	4% PROFITS
$ 1,000	100,000	50,000	33,000	25,000
$ 5,000	500,000	250,000	167,000	125,000
$10,000	1,000,000	500,000	333,000	250,000
$25,000	2,500,000	1,250,000	833,000	625,000
$100,000	10,000,000	5,000,000	3,333,000	2,500,000

BETTER EMPLOYEE MORALE, PRODUCTIVITY, AND PRODUCT QUALITY

An automotive parts manufacturer with 170 employees called on the consultation program for assistance in identifying and correcting occupational health and safety hazards. The consultant worked with the employer not only to identify and correct the hazards noted during the on-site visit, but also to help the employer develop and implement an effective workplace safety and health program. As a result of the visit the employer noted a much lower frequency in accidents, a reduction in workers compensation costs, and improved worker morale at the site. The company's president offered the following comment, "Utilizing the…consultative service demonstrated to our work force (which is represented by the Teamsters) our concern for their well being. Our Teamsters local is enthusiastic about our continued use of the consultative program. Not only did we reduce costs related to safety and health, but use of this valuable program provided me with a comfort factor because I know there will be no surprises in the plant."

OSHA ENFORCEMENT

Over the past several years, OSHA has added more safety and health management provisions to its standards. These provisions include self-inspections for specific conditions, employee training and specific types of hazard analysis. They also have focused more on management of workplace safety and health when enforcing the "general duty clause" (Sec. 5(a)(1), 29 U.S.C. 654). This clause requires that each employer "furnish each of his employees employment and a place of employment that are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees." As an employer, you have a responsibility to take feasible steps to render your workplace free of recognized hazards. As part of this responsibility, you have a duty to establish and maintain management practices necessary for ensuring that safe and healthful work practices are followed.

JUDICIAL PROCEEDINGS

When an employer is cited for a violation that he believes was caused by an employee's failure to obey a safety rule, evidence of good management practices is particularly important in establishing a defense. Decisions from the Occupational Safety and Health Review Commission and the U.S. Courts of Appeals clearly hold that, to establish an "employee misconduct" defense, an employer must show that it has adopted appropriate safety rules, and that it enforces these rules through such means as regular training and adequate supervision. In short, employers can avail themselves of this defense only by maintaining a comprehensive, adequate safety program.

APPENDIX 1-2

USING THE BELL FORMULA TO HELP DETERMINE YOUR COSTS OR SAVINGS

In his article, "Gauging Safety Outlays and Objectives," in Occupational Hazards, June 1987, David R. Bell describes a method you can use to find out the costs to your worksite when injuries occur, and the costs to your worksite's experience to your industry's average for lost workday case rates. To do this you use information published annually by the Bureau of Labor Statistics (BLS), other information easily available at your worksite, and Bell's formula for the calculation of "lost workday cases avoided."

To begin, find the latest published lost workday case rate for your industry by checking the BLS publication "Occupational injuries and illnesses in the United States Industry." (The BLS statistics are published annually – usually 1.5 years after the year for which they were collected – and are available from the U.S. Printing Office, Washington, D.C. 20402). In this publication, locate the table entitled "Reported occupational injury rates by industry." Make sure that you do not use the table that includes illnesses. When you have found the correct table, look for the SIC (Standard Industrial Code) that best describes your industry. From the table's column headed "Lost Workday Cases," take the number reported for the most recent year. That number represents the average lost workday cases per 100 workers. It is the lost workday case rate (LWCR) for your industry.

Next, calculate the employment at your site in terms equivalent to the data used by BLS. The BLS number represents the equivalent of one worker's full work year, whether it was actually worked through regular shifts, part-time work, or overtime work. To figure your equivalent employment, divide the number of total hours worked by 2,000. (The number 2,000 represents the average number of hours a full-time worker is generally expected to work each year in the United States.)

With this information, you can use the Bell formula to calculate how many injuries with lost workdays your site would have had if it had been exactly average for your industry. This number Bell calls "expected cases." You can compare this expected number to the actual number of lost workday cases you had at your site. If you had fewer cases than the expected number, the difference between the number of expected cases and the actual number of cases that you experienced at your site is called "injuries avoided." If you had more cases than the expected number, the difference id "excessive" cases.

Bell suggests that you also calculate the average cost of lost workday cases at your site. Bear in mind that both the direct and indirect costs as discussed in the preceding appendix. When you have found the average cost, you can use the Bell formula to figure how much you saved your company by "avoiding lost workday cases," or how much it cost your company to be over the average. You can also calculate the potential savings from improving your safety and health management enough to avoid more injuries.

This is Bell's formula:

$$\frac{\text{Average Lost Workday Case Rate} \times \text{Equivalent Site Employment}}{100} = \text{Expected Lost Workday Cases}$$

To illustrate further how this formula can work for you, consider a glass container plant that employed 200 workers in 1990. To apply the Bell formula to this site's safety and health statistics, begin by looking up the SIC code for glass container plant in Table 3 of the BLS bulleting. The SIC code is 3221. The table shows that for that SIC code in 1990 (the most recent figures available), the lost workday cases averaged 8.2 per 100 workers in that industry.

Next, calculate the equivalent employment for this site. You know from site records that in 1991 workers logged 456,432 hours of work at this site. Using 2,000 as the average number of hours a full-time worker in the United States is expected to work each year, you divide 456,432 by 2,000 to find the full-time equivalent employment at this site. The result of that division is 228.2. Applying the Bell formula, you multiply the lost workday case rate (8.2) by the site's full-time equivalent employment (228.2). The result of that multiplication is 1,871.2. Finally, divide 1,871.2 by 100 to find the expected lost workday cases if you were average for your industry. You can expect to find 18.7 (rounded up to 19) lost workday cases at this facility.

Rendering the Bell Formula mathematically, you get the following equation (with the answer rounded to the nearest whole number):

$$\frac{8.2 \times 228.2 = 19}{100}$$

The glass container plant, with its very good safety and health program, had only six lost workday cases. This was 13 (19 - 6 = 13) fewer than would have been expected had it been average for its industry. The employer estimates that lost workday cases incur direct costs averaging $16,800. By avoiding 13 of the expected lost workday cases for its industry, this site saves $218,400 in direct costs each year. Conversely, if this site had experienced 25 lost workday cases, subtracting expected cases from actual lost workday cases (25 - 19) would show that his site had six lost workday cases above its industry's expected average. These six lost workday cases would have cost $100,800 more than expected direct costs had the site been average.

Although economic incentives are secondary to human health and safety as motives for safety and health protection, the potential economic benefit of effective safety and health management is considerable and clearly worth considering.

Most people, correctly or not, believe their operation is significantly different from others in their SIC and reject the use of the formula. If you prefer to use your own history or other hypothesis to calculate probable case rates that certainly is not discouraged. It is very important, however, to use some reasonable method to project a quantitative case rate as a standard of measure.

How much would you save at your worksite if you could be below, or even 50 percent below, your industry average? These figures can help you make a good economic case for improving the management of your safety and health effort even if some spending is required.